REMARKS

In the Office Action dated July 12, 2004, claims 18-22 were examined with the result that all claims were rejected. In response, Applicant submits the following remarks. In view of these remarks, reconsideration of this application is requested.

In the Office Action, claims 18-22 were rejected under 35 USC §103(a) as being unpatentable over DeLuca et al U.S. 5,945,410. The Examiner indicated that the '410 patent taught a genus of vitamin D compounds which encompassed the presently claimed 2α-methyl-19-nor-20(S)-1α,25-dihydroxyvitamin D_3, and which taught the genus of compounds was useful in treating leukemia, colon cancer, breast cancer and prostate cancer. Although the Examiner admits that the '410 reference does not specifically teach the instantly claimed compound as being useful in treating these cancers, the Examiner concludes that it would be obvious to one of ordinary skill in the art to employ the instantly claimed compound in a method of treating these cancers. The Examiner's reasoning is that it is known vitamin D compounds are useful to treat such cancers and therefore one skilled in the art would have been motivated to employ any of the vitamin D compounds of the '410 reference in a method of treating such cancers. Applicant, however, respectfully disagrees for the following reasons.

The standard screening test for determining whether a vitamin D compound might be an anticancer agent is its activity in causing differentiation of HL-60 promyelocyte cells into the monocyte. This activity is typically compared with the natural hormone, namely, 1α,25-dihydroxyvitamin D_3 as the standard compound. Thus, if a vitamin D compound has activity greater than 1α,25-dihydroxyvitamin D_3 in cell differentiation, it would typically be considered a good candidate as an anticancer agent. However, if its activity is substantially less than 1α,25-dihydroxyvitamin D_3, then it is typically stated that such compound would probably not be a candidate as an anticancer agent.

Turning now to the cell differentiation data contained in the present patent application, Applicant would like to refer the Examiner to Fig. 3 and the data provided thereby. Fig. 3 illustrates a comparison of cell differentiation activity between 2α-

methyl-19-nor-20(S)-1α,25-dihydroxyvitamin D_3 (the data points illustrated by circles) as compared to 1α,25-dihydroxyvitamin D_3 (the data points illustrated by X's). As illustrated in Fig. 3, and as described at page 8, lines 17-23 in the specification as filed, these data provide a basis for the named compound (2AMD) as having activity demonstrating that 2AMD would be effective as an anticancer agent. This is because the molar concentration of 2AMD causing 50% differentiation is slightly less than 10^{-10} and the molar concentration for 1α,25-dihydroxyvitamin D for causing 50% differentiation is slightly higher than 10^{-9}. Thus, 2AMD results in 50% differentiation at a much lower concentration than is necessary for 1α,25-dihydroxyvitamin D_3 to cause 50% differentiation. Therefore, the description concludes that 2AMD is between 10-100 times more active than 1α,25-dihydoxyvitamin D_3 in causing differentiation of HL-60 cells.

Fig. 3, however, also illustrates data for 2β-methyl-19-nor-20(S)-1α,25-dihydroxyvitamin D_3 (the data points indicated by squares). This compound is the 2β isomer of 2AMD, and is also covered by and encompassed within the genus of vitamin D compounds disclosed in the '410 reference cited by the Examiner. However, as the Examiner can see from the data in Fig. 3, this 2β-methyl compound requires a molar concentration of about 10^{-9} to obtain 50% differentiation. As can be seen from the data in Fig. 3, this 2β-methyl compound is only slightly more active in causing cell differentiation than 1α,25-dihydroxyvitamin D_3. Therefore, although it has some activity in this regard, it probably would not be chosen by one skilled in the art as an anticancer agent because its activity is only about the same as 1α,25-dihydroxyvitamin D_3 rather than being significantly higher than 1α,25-dihydroxyvitamin D_3, absent some reason other than cell differentiation activity for selecting this compound. Likewise, Fig. 3 also provides differentiation activity for 2β-methyl-19-nor-1α,25-dihydroxyvitamin D_3 (the data points illustrated by triangles). This compound requires a molar concentration of about 10^{-8} in order to provide 50% differentiation. Thus, it can be said that this 2β-methyl compound is between 10-100 times less active than 1α,25-dihydroxyvitamin D_3 in causing differentiation of HL-60 cells. As a result, this compound is relatively inactive in

causing cell differentiation with the conclusion that this compound would not be a very likely candidate to be used as an anticancer agent.

As the Examiner can see, although both of the 2β-methyl compounds are covered by and encompassed within the genus of vitamin D compounds described in the '410 reference, neither of these compounds would be particularly desirable to treat leukemia, colon cancer, breast cancer or prostate cancer, based on their cell differentiation activity above. Thus, contrary to the Examiner's conclusion, one skilled in the art would not have been motivated to employ any vitamin D compound disclosed in the '410 reference to treat leukemia, colon cancer, breast cancer or prostate cancer since not all of the described compounds encompassed by the genus in the '410 reference have significant cell differentiation activity. Accordingly, Applicant requests the Examiner withdraw the rejection of claims 18-22 based upon the '410 reference.

An effort has been made to place this application in condition for allowance and such action is earnestly requested.

Respectfully submitted,

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